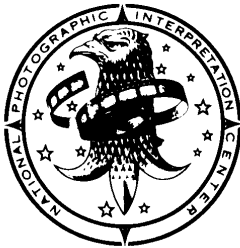


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PHOOTOGRAPHIC
INTERPRETATION
REPORT

NATIONAL PHOTOGRAPHIC
INTERPRETATION CENTER

**SS-X-16/-20-ASSOCIATED
COMMAND AND CONTROL
ACTIVITY, USSR (TSR)**

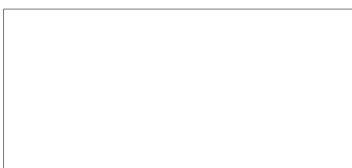
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NOVEMBER 1977

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DISSEMINATION CONTROL ABBREVIATIONS

NOFORN-	Not Releasable to Foreign Nationals
NOCONTRACT-	Not Releasable to Contractors or Contractor/Consultants
PROPIN-	Caution-Proprietary Information Involved
USIBONLY-	USIB Departments Only
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SS-X-16/-20-ASSOCIATED COMMAND AND CONTROL ACTIVITY, USSR (TSR)**ABSTRACT**

1. (TSR) Electronics equipment believed to be directly associated with the Soviet SS-X-16/-20 mobile missile system has been limited to truck- and trailer-mounted TWIN EAR troposcatter antennas and 30-meter-high lattice towers, probably supporting very-high-/ultra-high-frequency (VHF/UHF) antennas. This association is based upon the identification of TWIN EAR antennas, the construction of 30-meter-high lattice towers at SS-X-16/-20-related facilities within the Kapustin Yar Missile/Space Test Center [] and Plesetsk Missile/Space Test Center [] and the subsequent identification of this equipment at deployed strategic rocket forces (SRF) facilities.

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2. (TSR) SS-X-16/-20-associated electronics equipment has been identified at three facilities within the Drovyanaya ICBM Complex, one facility within the Novosibirsk ICBM Complex, and within the Konkovich MRBM Regiment of the Mozyr MRBM Division. No associated electronics equipment has been identified at the Kozhanovich MRBM Regiment or Mozyr Army Barracks AL 2 [] SS-X-16/-20 facilities.

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3. (TSR) Although no SS-X-16/-20-related building construction has been identified at the Yoshkar-Ola ICBM Complex [] and Gladkaya ICBM Complex [], 30-meter-high towers and tower foundations have been identified at these two facilities. The association of these lattice towers with possible SS-X-16/-20 activity at these two facilities and the association of recently constructed towers at Drovyanaya with SS-X-20 activity are based on the construction of lattice towers at deployed ICBM complexes after SS-X-16/-20 activity was underway at Kapustin Yar and Plesetsk and on a cable trenching pattern in the area of the towers similar to that which was identified at the Kapustin Yar MR/IRBM Bivouac/Troop Training Area. The location of the towers at Drovyanaya is a third factor associating the facility with SS-X-20 activity. A pair of lattice towers has been identified at mobile IRBM bases 1 and 2, formerly ICBM launch sites 4 and 3, respectively. A pair of lattice towers has also been constructed at the Drovyanaya ICBM Complex Command Post Alternate/Bunker.

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4. (S) This report includes a location map, 12 annotated photographs, and a table.

INTRODUCTION**Lattice Towers**

5. (TSR) Prior to the construction of 30-meter-high lattice towers at Kapustin Yar and Plesetsk, similar towers had been identified at deployed ICBM complexes. To date, these towers have also been observed at ICBM complex command post bunkers, at command post alternate bunkers, and at ICBM complex receiver and transmitter stations. Lattice towers have not been identified at fixed IRBM/MRBM facilities.

6. (TSR) Horizontal attachments possibly supporting VHF/UHF antennas have been identified on most of the towers which were constructed prior to the identification of the mobile missile program. The exact number of attachments on each tower has not been determined. These attachments are approximately 3 meters long and appear to be oriented toward the various command and control facilities within the ICBM complex. When more than two towers are present, at least two of the towers have the horizontal attachments and the remaining tower(s) supports FORK REST antennas.

7. (TSR) Only in one case—Drovyanaya Mobile IRBM Base 1 []—has a horizontal attachment been identified on an SS-X-16/-20-associated lattice tower. The attachment was generally oriented toward the Drovyanaya Command Post Alternate/Bunker.

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TWIN EAR Antennas

8. (TSR) Prior to the identification of TWIN EAR antennas at Kapustin Yar and Plesetsk missile/space test centers, TWIN EAR antennas had not been identified at deployed SRF facilities. Since then, however, TWIN EAR antennas have been identified at three SS-X-16/-20-associated facilities within the Drovyanaya ICBM Complex and at the Konkovich MRBM Regiment of the Mozyr MRBM Division. At both the ICBM complex and the MRBM regiment the TWIN EAR antenna was identified for the first time a few months after SS-X-20 construction had begun. Facilities with TWIN EAR antennas believed to be associated with SS-X-16/-20 activity are listed in Table 1. TWIN EAR antennas have not been identified at Kozhanovich MRBM Regiment, Mozyr Army Barracks AL 2, or the Novosibirsk ICBM Complex [].

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9. (TSR) Figure 1 shows facilities associated with the SS-X-16/-20 mobile missile system.

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BASIC DESCRIPTION

SS-X-16/-20 Activity at Missile/Space Test Centers

Plesetsk Missile/Space Test Center SSM

10. (TSR) The SS-X-16 program began at Plesetsk in 1972 but extensive building modification and construction did not begin until 1975. This modification program included new building construction at launch sites 4, 5, 6, and 7. In early 1976 a pair of 30-meter-high lattice towers was constructed at each of these modified launch sites. A cable trench extends from the base of the towers to a launch control bunker in the middle of the launch site. A cable trench connecting the two towers was not observed. A possible truck-mounted TWIN EAR antenna was identified at site 4 on photography [REDACTED] and a confirmed truck-mounted TWIN EAR antenna was identified at site 5 [REDACTED]

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Plesetsk SRF Army Missile/Space Test Complex Communications Center

11. (TSR) At the Plesetsk SRF Army Missile/Space Test Complex Communications Center, six 30-meter-high lattice towers had been constructed when this facility was observed on photography [REDACTED]. Five additional lattice towers were constructed [REDACTED]. Four of the new towers are deployed around a single-story building under construction. No cable trench was observed either between the towers or extending from the base of the towers to any of the buildings at the communications center. No antennas could be identified on any of the towers. The reason for such a large number of lattice towers has not been determined.

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12. (TSR) [REDACTED] two trailer-mounted TWIN EAR antennas in a stowed position and three support trucks were identified parked on a concrete apron at the communications center. [REDACTED] a truck-mounted TWIN EAR antenna was identified parked next to the two other TWIN EAR antennas.

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Plesetsk SRF Army and Test Complex Command Post Bunker

13. (TSR) Truck-mounted TWIN EAR antennas have been identified at the Plesetsk SRF Army and Test Complex Command Post Bunker [REDACTED] two truck-mounted TWIN EAR antennas were present at this facility. Only one was present on coverage [REDACTED] none were identified on photography [REDACTED] or subsequent coverages.

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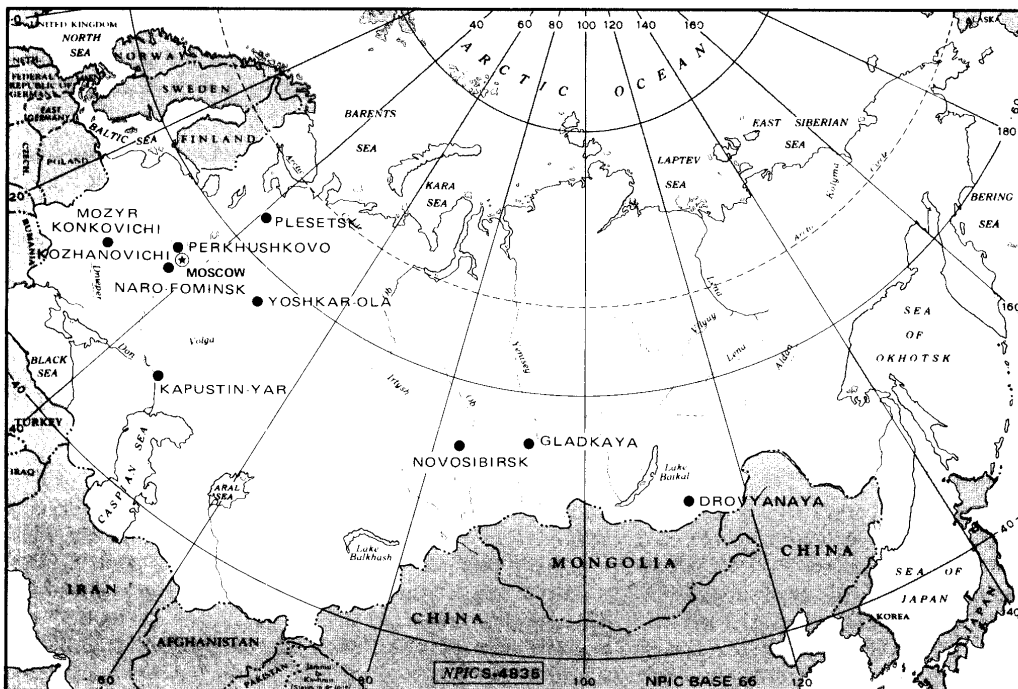


FIGURE 1. LOCATIONS OF SS-X-16/-20-ASSOCIATED MOBILE MISSILE FACILITIES, USSR

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Table 1. Facilities with TWIN EAR Antennas Believed to be Associated with SS-X-16/-20 Activity

This table in its entirety is classified TOP SECRET RUFF

Facility		Number and Type of TWIN EAR Antennas Observed		Remarks	25X1
Plesetsk Mobile ICBM Facility 1, Site 4		1 poss truck mounted			
Plesetsk ICBM Launch Test Site 5		1 truck mounted			
Plesetsk SRF Army MST Cplx Comcen		2 trailer mounted 2 trailer mounted & 1 truck mounted		The truck-mounted TWIN EAR antenna was not present when this facility was observed [redacted]	25X1 25X1
Plesetsk SRF Army A Test Cplx CP Bnk		2 truck mounted 1 truck mounted		TWIN EAR antennas were not present [redacted] or on subsequent coverage	25X1
Kapustin Yar General Support Area		3 truck mounted 1 truck mounted 3 truck mounted*			
Kapustin Yar MR/IRBM Biv/Trp Trng Area		2 truck mounted 2 trailer mounted* 2 truck mounted 1 truck mounted 3 truck mounted*		2 trailer-mounted TWIN EAR antennas have remained parked on the apron since [redacted] truck-mounted TWIN EAR antennas are at the GSE parking area of this facility	25X1
Drovyanaya ICBM Complex CP/Bnk		1 trailer mounted		TWIN EAR antenna was parked next to the comsat building; antenna has not been present [redacted]	25X1
Drovyanaya ICBM Complex CP Alt/Bnk		1 trailer mounted		TWIN EAR in a stowed mode parked in front of vehicle maintenance support building	
Drovyanaya Mobile IRBM Base 1		1 truck mounted		TWIN EAR was at site support facility; antenna observed in front of 11-bay garage at mobile IRBM Base	
Konkovichi MRBM Regt Rcvr/Bnk/Hd		1 trailer mounted		TWIN EAR antenna was parked across from entrance to control bunker but has not been present [redacted]	25X1 25X1

* Eight TWIN EAR observed on [redacted] was the highest number of TWIN EAR observed on a single day at Kapustin Yar.

Kapustin Yar Missile/Space Test Center

14. (TSR) The first photographic evidence of SS-X-20 activity at Kapustin Yar was in February 1974. This activity involved the modification of launch pad 3 at complex C, site 1. Electronics equipment associated with the SS-X-20 was first identified at Kapustin Yar on photography [redacted] when three truck-mounted TWIN EAR troposcatter antennas were identified in the general support area. [redacted] equipment directly associated with the SS-X-16/-20 program was observed. This equipment included a 15-meter SS-X-16/-20 van truck and four [redacted] MAZ-543 missile support vans. On photography [redacted] four pieces of net-/canvas-covered equipment were identified at the northeast end of the general support area. The equipment appeared to include one truck-mounted TWIN EAR antenna and three MAZ-543-type vehicles.

Kapustin Yar MR/IRBM Bivouac/Troop Training Area

15. (TSR) A concrete parking apron with a loop turnaround was constructed at this facility (Figure 3) [redacted] two cable trenches were extending from this parking apron into the training area. One trench originated at the center of the apron and the other trench from the side of the apron. The trenches appear to terminate at a barracks-type building in the training area.

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16. (TSR) On photography [] two trailer-mounted TWIN EAR antennas were parked next to the uncompleted apron. [] the two TWIN EAR antennas had been moved onto the apron (Figures 3 and 4). They were at this location on all subsequent coverages of the area. Cables extended from both of the TWIN EAR trailers to a probable junction box at the center of the apron. 25X1
25X1

17. (TSR) [] the antennas on one TWIN EAR set were raised [] 25X1
[] A possible correspondent may have been a truck-mounted TWIN EAR antenna at the Kapustin Yar/Lake Elton Tracking Facility [] 25X1
43 nautical miles (nm) northeast of the troop training area. A truck-mounted TWIN EAR antenna was identified at Lake Elton [] in an operational mode with its antennas oriented on an azimuth of 210 degrees. 25X1

18. (TSR) In addition to the TWIN EAR antennas at the MR/IRBM bivouac/troop training area, two 30-meter-high lattice towers have been constructed just west of the barracks-type building. On photography [] foundations for the towers were present. The lattice towers were complete when observed [] A cable trench connects the two towers. Extending from this trench are two more trenches which connect the towers to the barracks-type building and an incomplete silo which is east of the building (Figure 5). This silo was previously reported as having a possible command and control function.¹ There are no indications that a similar type of silo will be constructed at any other mobile IRBM bases at deployed SRF facilities. The barracks-type building adjacent to the silo probably functions as a command and control building in support of the SS-X-20 activity at Kapustin Yar. 25X1
25X1

19. (TSR) The silo was in an early stage of construction when observed on photography [] 25X1
[] The silo appeared to be almost complete when observed on imagery [] 25X1

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Activity at Deployed SRF Facilities**Drovyanaya ICBM Complex**

20. (TSR) SS-X-20-related electronics activity has been identified at the following four locations within the Drovyanaya ICBM Complex: the complex command post bunker, the complex command post alternate/bunker, and mobile IRBM bases 1 and 2 (formerly launch sites 4 and 3, respectively).

21. (TSR) **Drovyanaya ICBM Complex Command Post/Bunker.** The first identification of electronics equipment within the Drovyanaya ICBM Complex associated with the SS-X-20 was at the complex command post bunker when a trailer-mounted TWIN EAR antenna in a stowed position was identified on photography [redacted] The TWIN EAR antenna was parked near the communications satellite (comsat) station along with several unidentified vehicles (Figure 6). On [redacted] the TWIN EAR was not observed at this location and has not been observed there on subsequent coverages. 25X1 25X1

22. (TSR) **Drovyanaya ICBM Command Post Alternate/Bunker.** At the complex command post alternate/bunker a trailer-mounted TWIN EAR antenna in a stowed position was parked in front of the vehicle maintenance support building [redacted] 25X1 Two 30-meter-high towers are also present near this bunker. The towers were first seen on photography [redacted] No antennas have been observed on these towers. 25X1

23. (TSR) A cable trench extends from the west side of the vehicle maintenance support building and connects the two towers. The cable trench continues past the towers to a parking apron with a loop turnaround under construction. Each of the lattice towers has a cable trench extending from its base to the alternate command post bunker. A cable trench also extends from the west side of the bunker to the parking apron. Cable junction boxes have been identified on each side of the parking apron. When complete, this may be the parking area for the TWIN EAR antenna. In addition to the alternate command post bunker, lattice towers and TWIN EAR antennas have been identified at mobile IRBM base 1.

24. (TSR) **Drovyanaya Mobile IRBM Base 1.** At the support facility for mobile IRBM base 1 construction of two 30-meter-high lattice towers was first observed on photography [redacted] 25X1 [redacted] and was completed when observed on photography [redacted] No cable trenches 25X1 between the towers or from the towers to any of the buildings within the base have been observed. [redacted] a horizontal boom, probably supporting an antenna, was identified for 25X1 the first time on one of the SS-X-16/-20-associated lattice towers. The horizontal boom was oriented on an azimuth of 105 degrees which is in the general direction of the complex command post alternate/bunker.

25. (TSR) A truck-mounted TWIN EAR antenna has been observed at this base on three separate occasions. On photography [redacted] a truck-mounted TWIN EAR antenna was 25X1 identified apparently leaving the 11-bay garage area at the site support area. [redacted] 25X1 [redacted] a truck-mounted TWIN EAR antenna was observed 25X1 parked in front of the 11-bay garage at the launch site. [redacted] the TWIN EAR antennas were in a 25X1 half-raised position.

26. (TSR) **Drovyanaya Mobile IRBM Base 2.** Although no TWIN EAR antennas have been identified at the Drovyanaya Mobile IRBM Base 2 [redacted], two lattice towers (Figure 8) 25X1 are present at the site support facility. These towers were observed under construction [redacted] 25X1 [redacted] A cable trench [redacted] 25X1 connected the two towers to a building which probably functions as the command and control building (Figure 9). Cable trenches also extend from the towers and the probable headquarters building to the three- and single-bay garages at the launch site (Figure 10). Although not observed, it is believed that this same pattern of cable trenching exists at mobile IRBM base 1.

Konkovichi MRBM Regiment

27. (TSR) At the Konkovichi MRBM Regimental Receiver/Bunker/Hard a trailer-mounted TWIN EAR antenna in a stowed position was identified for the first time on photography in April 1976. This was the first identification of a TWIN EAR antenna at a deployed SRF facility. The TWIN EAR antenna was parked across from the entrance to the control bunker and it had been present at this location since February 1976. However, [redacted] the TWIN EAR antenna 25X1 was not present and it has not been identified on subsequent coverages. This has been the only identification of a TWIN EAR antenna within the Mozyr MRBM Division. At Konkovichi MRBM Regimental Command Post/Bunker [redacted] four 30-meter-high masts rather than 25X1 lattice towers were first observed on imagery [redacted] they were not present on photography 25X1 [redacted] The masts were connected by cable to each other but did not appear to be cable 25X1

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connected to the command post/bunker. Because of wooded areas and lack of apparent feedlines for the masts, the control facility for these masts has not been determined.

Kozhanovich MRBM Regiment

28. (TSR) No SS-X-20-associated electronics equipment has been identified within the Kozhanovich MRBM Regiment. On photography [] trenches were observed connecting the single-bay garages to the three-bay garages and connecting the three-bay garages to the regimental receiver control bunker. This receiver control bunker probably functions as the regimental command post bunker. This assumption is based on the lack of activity and communications masts at the bunker previously identified as the command post bunker.

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Novosibirsk ICBM Complex

29. (TSR) SS-X-20-associated electronics equipment has been identified only at Novosibirsk Mobile IRBM Base 1 (formerly launch site 2; []) two 30-meter-high lattice towers were identified at the site support facility. No cable scarring or trenching activity has been observed. Also, no TWIN EAR antennas have been observed within this ICBM complex.

25X1

Mozyr Army Barracks AL 2

30. (TSR) Although SS-X-20 construction activity is underway, SS-X-16/-20-associated electronics equipment has not been identified at Mozyr Army Barracks AL 2. Since this facility is in the midstage of construction, it may be too early for the identification of electronics equipment.

31. (TSR) SS-X-16/-20-associated electronics equipment also has not been identified at the Mozyr MRBM Division Command Post Bunker [] which is 3 nm northwest of the army barracks.

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SS-X-16/-20-Associated Activity at National Level SRF Facilities

32. (TSR) Identification of SS-X-16/-20-associated equipment at Perkhushkovo SRF National Command Center/Bunker [] and at Naro-Fominsk SRF Radio Communications Receiver Complex [] suggests that this equipment has a command and control function for the SS-X-16/-20 system.

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Perkhushkovo SRF National Command Center/Bunker

33. (TSR) Two 15-meter, SS-X-16/-20-associated van trucks were identified in the vehicle maintenance and storage area at Perkhushkovo [] This is the first time that this type of vehicle has been observed at a facility which was not directly associated with SS-X-16/-20 activity or deployment.

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Naro-Fominsk SRF Radio Communications Receiver Complex

34. (TSR) [] two SS-X-16/-20-associated, [] missile support vans were identified in the vehicle maintenance and storage area at Naro-Fominsk. Like the van trucks at Perkhushkovo, this is the first identification of SS-X-16/-20 equipment at a facility which has not been directly associated with the SS-X-16/-20 program.

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Other Possibly SS-X-16/-20-Associated Activity

35. (TSR) At the Yoshkar-Ola ICBM Complex [], a pair of 30-meter-high lattice towers was constructed in late 1976 at the command post bunker and at Yoshkar-Ola Launch Control Facility (LCF) A [] At the Gladkaya ICBM Complex foundations for two towers have been identified at the command post bunker. No construction activity related to the SS-X-16/-20 program has been identified within either of these two ICBM complexes.

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Yoshkar-Ola ICBM Complex

36. (TSR) At the Yoshkar-Ola ICBM Complex Command Post Bunker/Hard [] and at Yoshkar-Ola LCF A/Bunker, construction of a pair of 30-meter-high lattice towers was first observed on photography [] and was complete when observed on photography [] At Yoshkar-Ola LCF A (Figure 11) a cable trench also connected the two towers. The trench extended from the base of each tower to the command post alternate/bunker. Similar trenching patterns have been observed at Kapustin Yar MR/IRBM Division/Troop Training Area and at Drovyanaya ICBM Complex Command Post Alternate/Bunker. No cable trenches were observed between the new towers at the Yoshkar-Ola Command Post Bunker (Figure 12). A building similar to the one at the Plesetsk SRF Army Missile/Space Test Complex Communications Center was constructed at the Yoshkar-Ola Command Post Bunker at the same time the lattice towers were constructed.

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Gladkaya ICBM Complex

37. (TSR) At the Gladkaya ICBM Complex Command Post Bunker [redacted] Figure 25X1
 13), foundations for two lattice towers were identified [redacted]. Excavations for 25X1
 the foundations were first observed on imagery [redacted]. The pattern of cable trenching 25X1
 was very similar to the trenching pattern of previously identified lattice towers associated with the
 SS-X-20 mobile missile system and to the trenching pattern observed at Yoskhar-Ola LCF A.

38. (TSR) Other command and control-related activities have occurred within the Gladkaya ICBM Complex. This activity includes excavation into the command post bunker, relocation of the mobile comsat station, and change in the antenna inventory at the complex receiver and transmitter facilities.

39. (TSR) [redacted] an excavation was identified along the east side of 25X1
 the Gladkaya ICBM Complex Command Post Bunker. The excavation was almost completely filled 25X1
 in [redacted] but was reexcavated [redacted]. The second excavation 25X1
 appeared to be more extensive. Similar excavation of a command post bunker occurred at the
 Mozyr MRBM Division Command Post Bunker. That excavation was first observed in August 1976
 and was completely filled in when observed [redacted]. There were no indications 25X1
 of lattice towers being constructed at the Mozyr facility. The reason for this excavation activity has
 not been determined.

40. (TSR) Also at the Gladkaya Command Post Bunker, the mobile comsat station usually 25X1
 collocated at this facility has been relocated. When the excavation of the command post bunker 25X1
 began in January 1977, the mobile comsat station was not observed at this facility. [redacted] 25X1
 [redacted] mobile comsat equipment in an operational mode was identified at the Gladkaya ICBM
 Complex Command Post Bunker/Alternate [redacted]. The support vehicles were parked under
 two shelters which were constructed shortly after July 1976. This is the first identification of
 mobile comsat equipment at a facility which has no collocated, fixed comsat station. It is also the
 first time within the SRF that shelters have been constructed for mobile comsat equipment.

41. (TSR) Simultaneously with the construction activity at the command post bunker, new antennas were constructed at the receiver and transmitter facilities at the Gladkaya ICBM Complex.

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42. (TSR) [] footings for a fishbone antenna were identified at 25X1
Gladkaya ICBM Headquarters Radio Communications Receiver Station/Bunker [] 25X1
The fishbone antenna was oriented toward Moscow.

43. (TSR) [] seven antennas at Gladkaya ICBM Headquarters 25X1
Radio Communications Transmitter Station/Bunker [] had been removed and were 25X1
being replaced by five new antennas under construction.

44. (TSR) The new antennas consist of four double rhombic antennas and a horizontal dipole antenna. Two of the double rhombic antennas are oriented approximately 290 degrees, with Moscow as the probable correspondent. These two antennas are in the area where two double rhombic antennas oriented toward Dzhabul had formerly been located. The two other double rhombic antennas and the horizontal dipole antenna under construction are oriented approximately 90/270 degrees, with Omsk as the probable correspondent. These three antennas probably replace the two quadrant and three horizontal dipole antennas which have been removed.

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REFERENCES

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MAPS OR CHARTS

ACIC. US Air Target Chart, Series 200, Various sheets, scale 1:200,000

DOCUMENT

1. NPIC PIR-017/77, *Possible SS-X-20-Associated Command and Control Silo Under Construction at Kapustin Yar, USSR (TSR)*, Aug 77 (TOP SECRET RUFF)

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REQUIREMENT

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